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AND SEQUELÆ OF INFLUENZA.

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## THE NERVOUS AND MENTAL PHENOMENA AND SEQUELÆ OF INFLUENZA.

By CHARLES K. MILLS, M.D.

[Read January 13, 1892.]



ALL practitioners have been struck by the prominence of nervous and mental phenomena in influenza; and much has been written, but mainly in a desultory way, about the symptoms of the disease which are referable to the nervous system, and its more or less persistent nervous and mental sequelæ. The part played by the nervous system in the etiology and history of the disease has been variously interpreted. One holds that it is a "nervous disease," without explanation; another describes it as a pneumogastric neurosis; another as a neuropathy due to ptomaine poison. According to Blocq, cited by Church,<sup>1</sup> the primary infectious action takes place upon the nervous system during the disorder, while sequelæ are to be attributed to secondary infection from ptomaines. Cheston Morris,<sup>2</sup> of Philadelphia, advances the theory that the general symptoms of influenza may be traced to a derangement of function, or partial paralysis of the pneumogastric nerve, and that the affection is brought about by conditions of the atmosphere, which particularly tax the cardio-pulmonary apparatus which is regulated by this nerve, a view which, after all, relegates the disease to an atmospheric or infectious cause. Graves long ago referred the bronchial and pulmonary symptoms of grippe to lesions of the nervous power of the lungs, and Blakiston regarded it as a disorder of the nervous system, with concomitant derangement of the organs of digestion, circulation, etc. Levick,<sup>3</sup> who cites the last two authorities, holds that certain symptoms are produced when the poison is expended on the sensorium, and cer-

<sup>1</sup> Church: Chicago Med. Recorder, July, 1891, vol. i., No. 5, p. 418-426.

<sup>2</sup> Morris: American Lancet, March, 1891.

<sup>3</sup> Levick: Am. Journ. Med. Sci., January, 1864, and republication in pamphlet form, with notes of the influenza of 1889-90.

tain others when its influence is chiefly exerted on the respiratory centres.

The analogies or relationships between influenza and other diseases generally recognized as belonging to the nervous system, either primarily or because of the situation of their most notable lesions, have been strongly brought out by able writers, as by Levick, for example, who has even suggested that epidemic cerebro-spinal fever, or cerebro-spinal meningitis, may be simply a malignant form of influenza—a view to which he was led because of the resemblance in the symptoms of the two diseases, which differ in degree rather than in nature, and also because for three centuries the two have occurred coincidentally or in close sequence.

Grasset and Rauzier,<sup>1</sup> in a monograph on the grippe of 1889–90, lay great stress on the enormous predominance of the nervous over the catarrhal elements in the epidemic, as evidenced in the high fever, the intense cephalalgia, the marked delirium, the widespread pain, and the excessive nervous irritability. They refer to cases communicated by M. Coustan, in which the entire symptomatology of the disease seems to have reduced itself to a horrible migraine. They also review the literature which shows that writers of various countries are unanimous in proclaiming the importance of the nervous element—their references being to Austrian, Russian, Belgian, German, English, and Polish contributions.

According to Schmitz,<sup>2</sup> who read a paper on the subject before the Psychiatric Society, at Bonn, influenza is a disease of the nervous system with secondary involvement of the heart, lungs, and digestive organs. In several hundred cases which he observed the nervous symptoms were always primary, followed in every case by secondary manifestation in other organs.

What seems to be needed is an analysis and practical grouping of the facts, almost too numerous to handle, which shows the important part played by the nervous system in the development, progress, and results of the disease. How is the nervous system affected by influenza? What are its primary or direct effects on the nervous system, and what are some of the more persistent and permanent impairments, and how are these determined by the disease? What are its

<sup>1</sup> Grasset and Rauzier: *Leçon sur la Grippe de l'Hiver, 1889–90*; Montpellier and Paris, 1890. Monograph of 98 pages.

<sup>2</sup> Schmitz: *Allgemeine Zeitschrift für Psychiatrie und psychisch-gerichtliche Medizin*, 179, 1891. Cited in *American Review of Insanity and Nervous Disease*, December, 1891.



acute nervous and mental phenomena, and what are its most common sequences? What is the probable pathology of these states, and what treatment is best in view of the neurotic characteristics of the affection?

The briefest consideration of the subject brings forcibly to mind the fact that all diseases of infectious or toxic origin—epidemic, endemic, sporadic, or accidental—may strike any or all parts of the nervous system with a result which will be proportionate, first, to the virulence of the infecting agent; and, second, to the resistance of the individual, whether this is due to constitutional predisposition or to reductions the result of previous injury or disease. The microbes may differ, but a bond of union and close resemblance can be recognized between the effects on the nervous system of all contagious and infectious diseases, as variola, scarlatina, diphtheria, measles, whooping-cough, typhoid or typhus fever, leprosy, mumps, cholera, erysipelas, puerperal fever, influenza, or cerebro-spinal meningitis; of all such constitutional and diathetic affections as tuberculosis, gout, rheumatism, and diabetes; and of all such toxic agents, artificially introduced into the system, as alcohol, mercury, lead, arsenic, copper, and poisonous gases. These diseases, these diatheses, and these poisonous liquids, metals, and gases produce, or may produce, nervous and mental phenomena of the same character, differing in degree in particular cases and for special reasons.

In all these affections at the time of acute onset, if the illness is of a serious character, such symptoms are present as great mental and nervous debility, irritability, restlessness, sleeplessness, or the opposite states of torpor, stupor, hebetude, or coma; delirium; vertigo or syncope; headache, browache, napeache, backache, and limbache; pains of all degrees of severity referred to various nerve areas; hyperæsthesia of the skin, of muscle-masses, or confined to nerve-trunks or branches; spasms, local or general, and with or without unconsciousness; sometimes mental disturbance amounting to a true mania or melancholia. During the progress of such affections any one or several of these enumerated symptoms may be present. Any infectious or toxic disease may, in brief, produce the same symptom, syndrome, or train of phenomena; and—which is the main point—for the same reason, namely, because of the introduction into the system of an agent which directly and powerfully poisons nerve centres, and possibly also nervous conducting tissues.

Following all infectious, diathetic, or toxic diseases, moreover, or directly springing from them, common experience teaches that we

may have great nervous or general weakness; forms of insanity of the depressive type; paresis and paralysis of every grade from an affection of a single muscle to that of all the extremities, and even more; localized spasm or cramp; general convulsions; pains in nerves, muscles, and joints; and losses or perversions of sensation.

These symptoms and conditions, which may occur at the onset, during, or after the subsidence of any infectious or toxic disease, are those which constitute the nervous features of the prevailing epidemic. I have introduced the subject in this way because it seems to me that it is this comprehensive grouping of generically similar phenomena which enables us to most readily grasp a subject even for practical purposes. We differentiate phenomena in our daily labor which we can only understand by properly grouping them, and by referring them to a common or to related causes.

Any attempt to classify the nervous and mental phenomena of influenza must be attended with great difficulties. These are, in the first place, symptoms and conditions which, although manifested in non-nervous organs, are directly traceable to a nervous origin; secondly, affections which would be recognized by all as properly referred to the nervous system; and, thirdly, affections occurring in nervous tissues and organs, although, strictly speaking, not nervous diseases.

I will refer to the first of these classes briefly, although it is of much importance. I will not, however, discuss the nervous origin of the fever of influenza, nor will I attempt to explain the catarrh, indigestion, etc., on some neurotic theory, as such a method might lead us anywhere, and for our present purposes would be unprofitable. I wish simply to emphasize the fact that some of the most prominent pulmonary, cardiac, and vascular affections of influenza can best be explained on neural theories. Many personal observations, have led me to the conclusion, not new, which has recently been well presented by Elliott,<sup>1</sup> of New Orleans, that the pneumonias of influenza are often due to vasomotor paralysis; that they are, in fact, forms of blood stasis or passive congestion from vasomotor paralysis, which in its turn is dependent upon the action of the infection upon the pneumogastric centres and the nervous system in general. A distinct difference can be made out between the true pneumonic lung and this "grip-lung," as it has been termed by Elliott. Graves long ago attributed the œdema of the lungs which occurs in influenza to an affection of the vagus.

<sup>1</sup> Elliott: *The Climatologist*, vol. i., No. 1, August, 1891.



"The grip-lung," according to Elliott, "has a long and very varying condition of passive blood stasis unaccompanied by râles. If resolution occurs within three or four days, it is accompanied by large mucous râles, and no time is given for the slow appearance of bronchial breathing or bronchophony; but during the long continuance of the blood stasis an exudation occurs, increasing slowly, which will give, in time, some bronchophony and bronchial breathing, but never so complete as in pneumonia. Resolution never occurs in these cases with the suddenness that characterizes it in acute pneumonia. The condition passes off as gradually as it formed. The sharp, clear-cut, and sudden phases of the pneumonic attack separate it clearly from the obscure, irregular, and slow phases of the *grip-lung*."

Many disorders in various parts of the body are best explained on this theory of local vasomotor paralysis, although it is not necessary to attempt to force this explanation for all. Hemorrhages, minute, or even of considerable size, occurring in diverse localities, as in the retina, membrana tympani, and internal auditory apparatus, or in the skin, or mucous or serous membranes anywhere, may be due to deficient vasomotor tonus. Brain, kidneys, liver, or pelvic organs may suffer from forms of passive hyperæmia, subacute or chronic, which are in fact due to forms of vasomotor palsy. Occasionally we meet with cases of vasomotor disorders of the extremities, such as flushed or pallid fingers.

Even trophic affections have occasionally been observed. Wilson,<sup>1</sup> for example, refers to gangrene of the lungs as one of the less common complications. Abscesses of the limbs have been recorded. Grasset records two observations of eschars occurring in young subjects in the absence of prolonged decubitus. The greater tendency in surgical cases to suppuration may have its best explanation in the depression of healthful vasomotor and trophic influence.

The peculiar forms of pulse, and the uncertain or perverted action of the heart, extending in some cases to cardiac palsy and death, are in a strict sense nervous phenomena due to paralysis, partial or complete, of the inhibitory apparatus of the heart. Tachycardia and irregular pulse and heart action are sometimes left as chronic conditions.

Let me next take up those symptoms and affections which would clearly be recognized as belonging to the nervous system.

<sup>1</sup> Wilson: American System of Practical Medicine, vol. i. p. 870.

I believe, with Church, "that the infection of influenza has a marked action upon the nervous system which may give rise to immediate acute manifestations or to remote and persistent conditions; and that in the predisposed, grippe is competent to cause marked excitement or great depression of the motor, sensory, and mental nervous apparatus."

Great nervous and mental prostration, both as an acute manifestation and as a persisting sequel, has engaged the attention and required the treatment of all practitioners. The mental depression often present as an initial symptom has been, in some cases, simply overpowering. Some of the patients are affected as if their brain centres had been poisoned to the limits of human endurance, while still permitting the retention of consciousness. In other cases even consciousness itself has been overwhelmed.

Not a few patients who suffered from attacks of influenza during the early period of the present epidemic are still victims of profound neurasthenia. I refer now to cases which are not distinctively of the melancholic type. These neurasthenics are unable to endure a fair amount of work; their nervous forces are soon routed; they are weak, worrisome, and unrecuperative. The cardiac weakness which has been left is undoubtedly in part the cause of this neurasthenia, and with reference to this, Church says that "the persisting neurasthenic condition, which so usually follows influenza, is attributed by some to cardiac weakness of nervous origin, and this contention is not without weight, if it is observed that even after appetite, sleep, body-weight, and physical functions have been long restored, the slightest exertion immediately produces disproportionate fatigue accompanied almost invariably by either a retarded or more frequently accelerated pulse, and rarely by præcordial distress and even by angina pectoris."

Curtin and Watson,<sup>1</sup> whose experience in influenza has been enormous, say that although general nervous prostration often extended over long periods without any discoverable local cause, it was always worth while to examine the urine with care. "Sometimes a nephritis, sometimes a faulty digestion or hepatic inaction seemed to underlie the general condition in latent form. These cases, by enforced rest and attention to local complications, gradually recovered. These cases and nervous cases generally, were very disappointing when sent to the seashore during convalescence."

<sup>1</sup> Curtin and Watson: Am. Journ. Med. Sci., February, 1892. From proof-sheets.



Among organic nervous diseases which have developed during the influenza or have been left in its wake, are, in the order of their frequency, so far as my personal observation has gone, neuritis, meningitis, myelitis, and cerebritis, or various combinations of these inflammatory affections, as, for example, concurrent neuritis and myelitis, meningo-myelitis, or meningo-encephalitis.

Probably no single affection of the nervous system has been so common during and after the grippe, and particularly as a sequel of the disorder as neuritis. Almost every variety of neuritis, as regards location and diffusion, have been recorded, and have come under my personal notice. Multiple neuritis, while not common, has not been rare; and I have seen an apparent concurrence of this affection with poliomyelitis in the same case. Isolated neuritis of almost every cranial nerve has been recorded, with such resulting conditions as optic atrophy, loss of smell and of taste, ophthalmoplegias, both internal and external; oculo-motor, facial, and bulbar or pseudo-bulbar palsies of various types, including true pneumogastric paralysis. Several cases of specially located affections of the sympathetic ganglia or nerves have been recorded. Of the forms of local neuritis most common might be mentioned the supra-orbital, intercostal, sciatic, and plantar.

An interesting case of neuritis with a myxædemoid condition of the limbs presented herself at the Philadelphia Polyclinic recently. She had a sharp attack of influenza five weeks ago, having been in good health up to that time, except five years since, when she suffered for several weeks with inflammatory rheumatism. On recovering from the influenza, the attack not having been especially marked with nervous symptoms, she was extremely weak in the legs, and was scarcely able to drag herself around. In a few days, her feet and legs began to swell and to be painful, and soon became of enormous size and exquisitely tender. She has gradually improved, but still has a condition of firm swelling, which does not pit on pressure, from her knees to her ankles, and she also still has great tenderness on squeezing the feet or ankles, or in handling the nerves or muscles of the limbs. She has no cardiac affection.

The articular pain and other so-called rheumatic manifestations so numerous during and after attacks of the grippe, are after all best explained on the theory of infectious neuritis or myositis.

These cases, with articular and other pains, and with swelling, recall the endemic or epidemic form of multiple neuritis known as

beri-beri, in which the chief phenomena are œdema and paralysis of the limbs, with marked pain, hyperæsthesia and paræsthesia, followed later by anæsthesia, lost knee-jerk, and depressed electrical reactions. Myositis certainly, and probably also periositis, occur as complications or sequences of the influenza, and usually in association with neuritis of some type.

Many of the reports speak of the frequent occurrence of various neuralgias. Doubtless a distinction is seldom made by observers and recorders between neuralgia and neuritis, which are or may be separate affections. Practically those cases should be regarded as neuralgic, in which pain is referred to certain nerve lines or radiations; but in which pain on pressure, and the other phenomena of neuritis, such as anæsthesia, vasomotor, and trophic disorders and even paralysis, are absent. In my own experience the cases which could properly be diagnosticated as neuritis are by far the most common. The distinctively neuralgic pains are probably due to toxæmically depressed or exhausted sensory nerve-roots or centres in the cord and bulb.

Of diseases of the spinal cord proper, occurring as complications or consequences of influenza, the reported cases are not numerous, but they are none the less important. A few cases of myelitis have been put on record by native and foreign observers—one that I recall in which all four extremities were paralyzed. As would be expected, in accordance with the analogies with other infectious and toxic diseases, anterior poliomyelitis is the most common type. I have had several cases of temporary paralysis of one or more limbs, which, owing to the absence of pain and of cerebral symptoms, were apparently spinal in their origin, and probably light forms of inflammation.

Several observers have reported cases of bulbar paralysis, and one striking example of this disease, attributed to the grippe, has come under my own observation, although exactly how far the influenza was responsible it is difficult to say. This patient, a clergyman, had a severe attack of influenza in May, 1890, and during its progress continued to work, and ate but little. In a very short time he noticed he was losing power in his hands, which soon atrophied. In January, 1891, he began to have difficulties of speech; and, briefly stated, the case went on until November, 1891, when he was first seen by me; his symptoms were those of well-marked bulbar paralysis, with progressive muscular atrophy, chiefly involving the upper extremities.



In accordance with analogy, we would expect the occasional occurrence both of nuclear polioencephalitis, and even rarely Strumpell's cortical polioencephalitis. One or two of the few cases of Probable polioencephalitis of the latter type have occurred in patients suddenly stricken with fever, loss of appetite, and other symptoms which may have been due to infection.

Priester<sup>1</sup> has reported the case of a man fifty-four years old, who was taken with influenza in February, and in the beginning of March was seized with extremely violent headache which resisted all medication, and later the patient became deeply somnolent, remaining in this condition for four weeks; he could be aroused, but was apathetic and soon slept again. Reflexes and temperature were normal; pulse from 40 to 60. The patient had no paralytic symptoms, and slowly improved. His affection, according to the report of the case, closely resembled Gerber's disease—paralyzing vertigo—although the latter is a disease of the warm weather. Tumor could be excluded by the absence of all focal symptoms a year before the attack. The most probable cause Priester believed was a pathological process, involving the central gray matter of the third ventricle, which would bring the disease into close relation with polioencephalitis of the nuclear type. Dr. G. J. Kaumheimer, who translated this report for the *Review of Insanity and Nervous Disease*, December, 1891, observed an exactly parallel case which originated in April, and lasted into July before recovery took place.

That meningitis, either cerebral, spinal, or cerebro-spinal, occurs during the progress of the decline of the influenza cannot be doubted in the light of the evidence which has been presented by various observers, and particularly during the epidemic of the last three years. It is, however, a comparatively rare concomitant or complication. Some of the facts adduced as proofs of the existence of meningitis, and some of the cases reported as examples of the disease, are clearly instances of improper interpretation. The intense cephalalgia and rhachialgia; the atrocious pains variously localized in the face, trunk, limb-nerves, muscles or joints; the vigilant delirium, with hallucinations and delusions, sometimes assuming great gravity; the intense vertigo, with or without nausea and vomiting—these and other well-known nervous manifestations which are so prominent in many cases at the initiation of the disease, are not necessarily evidences of meningitis, or even of meningeal hyperæmia. Rather they

<sup>1</sup> Priester; Wiener med. Wochenschr., No. 27, 1159.

are due to an overwhelming toxæmia of the nerve centres and of the brain. Severe and terrible in character at first, they frequently pass away almost as rapidly as they came, which would not be the case if they were the evidences of a true meningitis. The enormous prostration which is left behind shows that the centres of nervous energy have been subjected to a depressing agency of great virulence, not that merely enveloping membranes composed mainly of fibrous tissue and bloodvessels have been congested or inflamed. No reason could be given why such congestion or inflammation should leave such results.

The reports of cases terminating fatally because of meningitis, and even the reports, personal or official, of the frequent occurrence of this affection, must be received cautiously, and sometimes incredulously. They are only to be relied on when confirmed by autopsies, or when from observers who are accustomed to closely differentiate the meaning of nervous symptoms, and particularly of pain.

It may also be worth while at this point to refer to the somewhat frequent diagnosis of chronic meningitis as one of the sequelæ of the disease. This diagnosis is usually made because of the presence of more or less persistent pain in or on the head. Experience has led me to believe that this pain is usually neuritic rather than meningeal. Even deep-seated intra-cranial pain does not necessarily indicate meningitis. It may be due to neuritis, just as certainly as a pain in the hand or foot. The fifth nerve has an immense distribution within as well as outside the cranium, largely to the dura mater but also to other tissues and parts. It is a pathological possibility to have dural neuritis without a pachymeningitis, and this is the true explanation of some pains, both acute and chronic, which are present in other diseases as well as in influenza.

The form of meningitis most likely to be present in influenza is inflammation of the pia arachnoid or soft membranes, now often designated lepto-meningitis. From observations, corroborated by autopsies, I know that this affection may exist without pain; while pain of varying degrees of severity, and usually intense, is practically invariable in pachymeningitis. Lepto-meningitis, however, is not usually without pain and hyperæsthesia as symptoms, but it may be absent, and its presence or absence will depend upon the location, extent, grade, and complications of the meningitis.

While believing that these criticisms upon the sometimes hasty, and the too frequent diagnosis of meningitis in influenza, and indeed in many other infectious and febrile diseases, are just, and can be



sustained, it remains true that a genuine meningitis, sometimes of malignant type, may appear during the progress of or closely following influenza. Competent observers have reported such cases, and in a few instances the diagnoses have been confirmed by autopsies. The diagnosis should be made to hinge upon the signs and symptoms which would be satisfying as to the occurrence of meningitis from any cause; not alone on the presence of such phenomena as headache, vertigo, and vomiting, but on such more convincing manifestations as optic neuritis and localized spasms or palsies, either cortical or of cranial nerves.

The fact that meningitis, and even the cerebro-spinal form, does occasionally occur in influenza, is by no means proof that this disease and epidemic cerebro-spinal fever are identical. It simply emphasizes the point with which I started, namely, that every infectious or poisonous agent introduced into the economy may produce the same or similar pathological results in the nervous system. Largely according to the vulnerability, special or general, of certain tissues and organs, will be the preponderance of this or that form of so-called disease—for instance, of neuritis, myelitis, meningitis, cerebritis, or of combinations of these affections. All infectious and toxic diseases give neuritis as the most common acute or chronic inflammatory manifestation, although myelitis, cerebritis, and meningitis may occur. Even in cerebro spinal fever, as I was perhaps the first to point out, multiple neuritis is a common complication; but the infection being virulent and overwhelming, we may not only have meningitis but even meningo-encephalitis, or meningo-myelitis, with all their malignant phenomena and permanently disastrous results.

Vertigo is another symptom, like pain, often improperly referred to meningeal or cerebral inflammation. It is sometimes due to such disease, but occurring in influenza it may arise from other causes, as, for instance, from extravasations into the labyrinth or other portions of the auditory apparatus, or from great central exhaustion.

Müller<sup>1</sup> reports the case of a man, fifty years old, who after influenza presented great physical exhaustion. In a few weeks his mind seemed affected and he became somnolent, so that he could be roused only with difficulty and would then fall asleep again. In this respect the case was much like the one reported by Priester. Pain upon pressure was present over the vertebrae, the neck was rigid, the pulse was small and irregular, the skin reflexes were

<sup>1</sup> Müller: *Berlin klin. Woch.*, No. 37, 1890. Cited in *American Journal of Insanity and Nervous Diseases*, December, 1891.

diminished, and the tendon reflexes were absent. In two weeks he began to improve. The author believed the case was one of cerebro-spinal meningitis similar to that seen after infectious diseases.

Without entering into a discussion of their pathology or their peculiarities, I will briefly mention a few other forms of nervous disorder, occurring during or as apparent sequelæ of the influenza, examples of which have come under personal observation. Convulsions have been reported by various observers, and in a few instances the convulsive habit has been established, and the patients have remained up to the time of report as cases of epilepsy. I have seen two such cases. Hystero-epilepsy and other grave hysterical phenomena have been initiated, or have recurred in cases in which the symptoms had long been dormant. Of local spasmodic affections I have seen no records, but one case of persistent clonic torticollis, with some pain and tenderness in the spinal accessory distribution, has been in attendance at the Philadelphia Polyclinic. Two cases of facial paralysis, occurring immediately upon the heels of influenza, have come under my observation.

Many affections not of, but occurring in, the nervous system have been reported as complications or sequences of the influenza. These include such affections as apoplexy, due either to hemorrhage, thrombosis, or embolism. One of my Polyclinic patients, a man thirty-seven years old, was attacked with influenza in January, 1890. He was not confined to bed, but suffered severely from headache, cough, and persistent general weakness, and in February he was suddenly paralyzed in the right half of his body, and completely aphasic. Well-marked cardiac murmurs were present. The grippe in this and similar cases is probably causative by lighting up old endocardial trouble, or through the blood dyscrasia and general prostration which it leaves.

Various observers have reported cases of monoplegia and hemiplegia, without indicating their pathological character.

Recently, in consultation, I saw a typical hemorrhagic apoplexy occurring in a case of influenza in a woman about sixty years old, who had previously been in fair health, and was not known to have had any disease of the kidneys or heart, although her vessels were somewhat atheromatous. Dr. S. S. Prentiss,<sup>1</sup> of Washington, has reported three cases of cerebral apoplexy occurring during the progress of the influenza: one was in a man of fifty-seven years of age;

<sup>1</sup> Prentiss: Medical News, August 29, 1891.



another in a man of eighty-seven; a third in a woman of sixty-seven. One of these at least was hemorrhagic; the other two from the histories were probably from thrombosis. In cases of this character the infection of the disease acts to bring about an apoplexy both by the changes which it produces in the blood, by its effects upon cardiac action, and by the general debility induced. Such apoplexies might occur from other depressing causes; they are to be regarded not as phenomena, but rather as accidents of the epidemic.

Uremic convulsions in patients suffering from chronic Bright's disease have been precipitated by the influenza. The disease has also seemed to me to have been active in lighting up lurking syphilitic taint.

In one case of parietic dementia of somewhat irregular type, seen in consultation, the initial symptoms of the disorder were observed soon after recovery from a severe attack of grippe, the wife and friends of the patient in fact attributing the mental disorder to this attack. The probabilities are that syphilis was present, but latent, prior to the epidemic.

Purulent meningitis and brain abscesses have been somewhat frequently noted in connection with the numerous instances of purulent otitis media.

The relations of influenza to insanity have not received much attention from writers. Mairet,<sup>1</sup> of Montpellier, has recently published a lecture on the subject delivered at his clinic for mental and nervous diseases. Rush, who is referred to by Mairet, speaking of the epidemic which lasted from 1789 to 1791, and particularly of the year 1790, mentions that several persons were stricken with symptoms of insanity, and that one attempted suicide; he also speaks of several having had hallucinations of sight. Bonnet, reporting on the epidemic of 1837, cites one case which was stricken with a furious mania as the result of the grippe; and Petrequin, referring also to the same epidemic, records several patients tormented by melancholy ideas, and states that four or five suicides were accomplished or attempted at the hospitals in Paris.

The following conclusions compress into small compass so much that is valuable, with reference to the relation between influenza and the psychoses, that I cannot do better than quote them. They are reported as the conclusions arrived at by Dr. Leledy, and were pre-

<sup>1</sup> Mairet: Grippe et Aliénation Mentale. Montpellier and Paris, 1890.

sented to the Medical Society of London by Dr. Savage:<sup>1</sup> "1. Influenza, like other febrile affections, may establish a psychopathy. 2. Insanity may develop at various periods of the attack. 3. Influenza may induce any form of insanity. 4. No specific symptoms are manifested. 5. The rôle of influenza in the causation of insanity is a variable one. 6. Influenza may be a predisposing or exciting cause. 7. In all cases there is some acquired or inherited predisposition. 8. The insanity is the result of altered brain nutrition, possibly toxic. 9. The onset of the insanity is often sudden, and bears no relation to the severity of the attack of influenza. 10. The curability depends on general rather than on special conditions. 11. The insane are less disposed to influenza than are the sane. 12. In rare instances, influenza has cured psychoses. 13. The insane may have mental remission during the influenza. 14. There is no special indication in treatment. 15. Influenza may lead to crimes and to medico-legal issues."

I can indorse from experience almost every one of these conclusions. With reference to the statement that no specific symptoms are manifested, it should be said, however, that while this in a general sense is true, the most frequent type is a form of melancholia.

These and other cases of active insanity have been observed at the onset of influenza and during its height, but more particularly during its period of decline and convalescence. The published cases have been recorded chiefly as instances of acute mania or melancholia. The commonest type of grippe mental disorder, as I have just stated, is a form of melancholia or lypemania; but as this not infrequently assumes the form of melancholia agitata, it is often regarded as mania by practitioners not accustomed to differentiate the varieties of insanity. These patients are intensely depressed and emotional; they are filled with apprehensions of disgrace and ruin; they believe that they will never recover their former health; they are suspicious and delusional with reference to those who surround them; they are frequently unwilling to eat, or to rest, or to take medicine; and in some cases they have definite delusions of terrible character, for the most part hypochondriacal or religious. They are frequently plagued with the thought of suicide, and sometimes make successful or unsuccessful suicidal attempts. They have been deprived by the ravages of the disease of mental and moral stamina. In the majority of these cases, but not in all, some hereditary or acquired predisposition

<sup>1</sup> Savage: *Lancet*, No. 3558, and *Medical News*, January 16, 1892.



is present. While, however, the grippe usually gives us mental disorder of special type, a form of delusional melancholia, yet under special conditions it may be, as stated by Savage, the starting-point or exciting cause of any variety of mental disorder, as mania, paranoia, parietic dementia, hebephrenia, etc.

The investigations of Church show that in each year, in Cook County, Illinois, the epidemic of influenza has been attended by an increase in the number of proceedings for the commitment of the insane, which he believes cannot be explained by increase or movement of the population of the county.

Of the influenza occurring in hospitals for the insane, I have had no opportunity for observation except in connection with the insane department of the Philadelphia Hospital. A great disproportion has been observed between the number of cases occurring among the women and the men. One hundred cases are recorded as having occurred among four hundred and sixty female patients; and only three in a larger number of men. The disease did not prove particularly disastrous among these patients, only three deaths having occurred, from pulmonary complications. The cases were, as a rule, not of severe type; less severe than in an equal number of sane patients.

K. Helweg<sup>1</sup> has recorded the results and action of influenza in the Asylum at Aarhus, Denmark, and Pritchard has translated and summarized this paper for the *Review of Insanity and Nervous Disease*, for December, 1891. The account is of such interest that I will give it in detail: "The disease appeared in the asylum January 4th, a few weeks after it had first been observed in the neighborhood. Out of 520 insane 41 were so severely attacked that they were confined to their beds. The disease seemed decidedly contagious. It spread with difficulty on account of the wards being divided one from another. Eight of the twenty-five wards were spared altogether. When a ward would be invaded, the disease would rapidly run its course to proceed to another. The transmission of the contagion could be distinctly seen in the sick wards where those stricken down in the other wards would bring the disease with them and transmit it to patients there. Seven patients had pneumonia. A relatively large percentage (six) died, of which four were from pneumonia. Among these was a man with such a severe cerebral disease that he must be excluded (the post-mortem results in the other five, which

<sup>1</sup> Helweg: Hosp. Tidende, R. 3, Bd. viii., S. 729.

were women, were all more or less similar). The most essential results were extreme hyperæmia of the cranial bones and membranes, where the dura and the brain mass itself twice presented fresh and strongly vascular pseudo-membranes with small hemorrhages as well. The veins and arteries of the thinner cerebral membranes were filled to bursting with blood; the large basal arteries were so filled with coagula that they stood out like cords, or those of an injected specimen. The brain substance itself was very hyperæmic, and its consistence increased. The average weight of these brains was about the ordinary of those of Aarhus. The writer also gives the history of the man mentioned, and those of the three other cases where influenza could not be diagnosticated during life, including the post-mortem findings of a case of influenza in a (sane) nurse who died of pneumonia. Here also was great hyperæmia of the brain and its membranes, yet not so pronounced as in the insane cases. The writer has seen influenza accompanied by severe psychic symptoms. In a few cases, the condition resembled acute delirium, which, however, is transient, and seems easily controlled by antifebrin. On the contrary, in two hopeless cases of insanity the disease had such a favorable and curative action that they may be regarded as cured. In both cases there was pneumonia."

The influenza epidemic has impaired the *morale* of the community. Lack of spirit in work, and an apprehensiveness with reference to health, business, and all matters of personal interest have been abnormally prevalent. The hysterical have become more hysterical; the neurasthenical more neurasthenic. Hypochondria has displaced hopefulness in individuals commonly possessed of courage and fortitude. In brief, certain neuropathic and psychopathic features have been temporarily impressed upon the community. We cannot afford, even, to entirely dismiss from consideration the bearings of the epidemic upon the increase not only of suicides, but of other grave crimes.

The use in influenza of hypnotics, narcotics, sedatives, and motor depressants is a question of particular interest in connection with the study of the nervous and mental phenomena of the disorder. The views of practitioners and writers are here decidedly at variance. Serious mental and nervous complications or actual insanities occurring during influenza have been attributed to the too free use of such chemically powerful remedies, as phenacetine, antipyrine, antifebrin, chloral, bromides, sulfonal, and paraldehyde; and our older narcotics such as opium, hyoseyamus, conium, and cannabis Indica have also come in for a share of blame. Persisting conditions of



nervous prostration, and chronic respiratory and cardiac neuroses, have also been charged to drugs. Undoubtedly such criticisms have some foundation, but it remains true that each of the remedies named has proved itself of some value in the treatment of influenza, and particularly of its nervous types. The enormous consumption of a drug like antipyrine is a practical argument both for and against its use. What Grasset has said of this remedy might with almost equal truth be said of almost any of the rest. "This agent," he says, "vaunted by some as a panacea against all manifestations of the disease, is considered by others a remedy absurd and irrational in all cases. The truth would seem to reside between these two extreme opinions."







